REMARKS

With the present amendment, claim 7 has been amended to depend from claim 6 instead of claim 5.

Claims 1 and 5

Claims 1 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Baker (U.S. Patent 6,122,613).

Independent claim 1 provides a method of training a natural language unit. The method includes generating a first meaning set from a first corpus using a first natural language unit and generating a second meaning set from a second corpus using a second natural language unit. The first meaning set is compared to the second meaning set to generate a score and the score is then used to determine how to modify the first natural language unit.

Independent claim 1 is not obvious from Baker. In particular, Baker does not show a first corpus and a second corpus. Instead, Baker decodes a speech signal using two different speech recognition systems.

In the Office Action, it was asserted that using natural language units to analyze text was notoriously well known and that it would be obvious to one of ordinary skill in the art to modify the system of Baker to generate two meaning sets from text instead of speech signals. Applicants respectfully dispute this assertion.

In Baker, two speech recognition systems decode a single speech signal to provide two sets of candidate words that may be represented by the speech signal. Each recognition system provides a score for each candidate word it identifies. The scores are then combined using a weighted average of the scores from the two speech recognition systems.

Thus, the Examiner is asserting that it would be obvious to replace the speech signal of Baker with a text then use this text to identify text represented by the text. No one,

skilled or unskilled in the art, would ever do this. If the text is provided, Baker is no longer needed since the whole point of Baker is to identify unknown text from a speech signal. If the text is known, the teachings of Baker are useless.

Further, if the speech was replaced with text, there would be no scores for the candidate text since Baker only suggests a system that can score candidates based on an input speech signal, not an input text. Therefore, with the suggested change to Baker, it could no longer be said that Baker performs a step of comparing two meaning sets to generate a score since there would be no way to generate the score without the input speech signal.

Applicants further note that claim 1 requires a first corpus and a second corpus. However, in Baker, the same speech signal is applied to both speech recognizers. Thus, there is not a first speech signal and a second speech signal, but only a single speech signal that is applied to both speech recognizers.

Since replacing the input speech signals with text would never be done in Baker since it would defeat the entire purpose of Baker, which is to improve speech recognition, claim 1 and claim 5 which depends therefrom are not obvious from Baker.

Claims 2-4,6 and 7

Claims 2-4, 6 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Baker in view of Berger et al. (U.S. Patent 6,304,841, hereinafter Berger).

Claims 2 and 3

Claim 2 depends from claim 1 and includes a further limitation wherein the first corpus comprises a corpus written in a first language and the second corpus comprises a corpus written in a second language.

In the Office Action, it was asserted that although Baker does not show two corpora written in two different languages, Berger does show two such corpora and it would be obvious to combine these two references so that a first corpus in Baker is written in a first language and a second corpus is written in a second language because it would enable the system to train the recognizers to translate speech from one language to another, hence expanding the capabilities of the system. Applicants respectfully dispute this assertion.

First, there is no mention in either Baker or Berger for combining these two references to form a speech recognition system that translates speech from one language to another.

Second, it is not clear how these two references would be combined so as to read on claims 1 and 2. Under claim 2, a score is produced by comparing a first meaning set and a second meaning set produced from a first corpus and a second corpus, respectively, that are written in two different languages. However, Baker only has a single speech input. Baker has no mechanism for dealing with corpora of two different languages or for comparing two meaning sets generated from two corpora of different languages. Thus, how would the single speech input in Baker be replaced with corpora in two different languages to form a functional system? The references are silent on this point and as such the combination suggested by the Examiner is not obvious.

In addition, although the Examiner says that this combination would be made because it would enable a system to train recognizers to translate speech from one language to another, the combination suggested by the Examiner would not have this functionality. In particular, the Examiner has asserted that to read on claim 1, Baker would substitute a text for the speech signal. As such, Baker would no longer be converting a speech signal to text, but would be converting one text to another. As stated above, converting one text to another would

not result in a score for the text and thus would not provide a way of comparing two meaning sets formed from two different corpora.

Since neither Baker nor Berger suggest the combination made by the Examiner and it is not clear how a functional system that reads on claim 2 could be formed through the suggested combination, the invention of claims 2 and 3 is patentable over the combination of Baker and Berger.

Claim 4

Claim 4 depends from claim 1 and includes further steps of generating a meaning set from the first corpus. These further steps include performing a syntactic parse on the first corpus to produce a set of syntactic parses and performing semantic interpretation of each syntactic parse to produce the meaning set.

In the Office Action, it was asserted that Berger teaches performing a syntactic parse and a semantic interpretation of a syntactic parse at column 13, lines 11-15, column 6, lines 22-26 and tables 3A and 4A. In particular, the Office Action asserted that by looking at table 3A, the text must have been parsed and interpreted in order to make the connections between the first and second languages. Applicants respectfully dispute this assertion.

In fact, the alignments shown in tables 3A, 4A and 5A are hypothesis alignments that are randomly formed. As noted in column 7, lines 21-26, there are 2^{LM} possible alignments between a series of M source words and a series of L non-null target words. Although not shown, Berger could have included a table for each of these possible alignments. Thus, the alignments shown in tables 3A, 4A and 5A do not show that a syntactic parse or a semantic interpretation has been performed in Berger. In fact, it is quite possible to practice Berger without performing

a syntactic parse or a semantic interoperation using statistical alignment methods. Such alignment methods look at a large number of bilingual sentences and guess at translations for words based on the number of times the words appear in the bilingual sentences together. For example, if "mujer" appears in Spanish sentences that correspond to English sentences that contain the word "woman" a large number of times, the statistical alignment methods guess that "mujer" is a translation for "woman". No parsing is necessary for such a guess.

Further, it is not clear how Berger could be combined with Baker to form the meaning sets of Baker. In Baker, speech recognition techniques are used to identify candidate words. Baker does not say that these techniques involve syntactic parsing or semantic identification or that syntactic parsing and semantic identification could be added to Baker when forming the candidate words. Thus, even if Berger showed syntactic parsing and semantic interpretation, there is no suggestion for how such parsing and identification could be used to identify candidate words in Baker. As such, claim 4 is not obvious from the combination of Baker and Berger.

Claims 6 and 7

Claims 6 and 7 depend from claim 5 and include further limitations to modifying a first natural language unit based on a difference between a score and a second score to produce a modified natural language unit as well as generating a fourth meaning set from the first corpus using the modified natural language unit, comparing the fourth meaning set to the second meaning set to determine a third score, and using the third score to determine whether to further modify the natural language unit.

The combination of Berger and Baker does not show or suggest the invention of claims 6 and 7 because there is no teaching for how these references could be combined to form the

invention of claims 1 and 5. As noted above, Baker does not show generating meaning sets from two corpora, but instead generates candidate words from a speech signal. It is not clear how the corpora in Berger could be used with the Baker method since the Baker method requires a speech input and not a text input. Replacing the speech input of Baker with the corpora of Berger would completely destroy the functionality and purpose of Baker. Thus, the corpora of Berger could not be combined with Baker to form a functional system that reads on claims 1 and 5.

Since the combination of Baker and Berger does not provide a functional system that reads on claim 1, claims 6 and 7, which depend indirectly from claim 1, are not shown by this combination. Therefore, claims 6 and 7 are not obvious from the combination of Baker and Berger.

Claims 8, 10 and 15

Independent claim 8 is directed to a computer readable medium having computer executable instructions for performing steps for training natural language units. The steps include converting a corpus of sentences into at least two meaning sets using at least two different natural language units. The meaning sets are then compared to evaluate the performance of one or more of the at least two natural language units.

Independent claim 8 and dependent claims 10 and 15 were rejected under 35 U.S.C. § 103(a) as being obvious from Baker. In the Office Action, it was noted that Baker does not teach generating meaning sets from corpora. However, it was asserted that it would have been obvious to one skilled in the art to modify Baker to generate meaning sets from text instead of speech signals.

As noted above, Applicants respectfully dispute this assertion. In particular, the entirety of Baker is dedicated to

speech recognition. As such, replacing the speech input with text would effectively render Baker useless.

Since it would not be obvious to replace the speech signals in Baker with a corpus of sentences, the invention of claims 8, 10 and 15 is not obvious from Baker.

Claims 9, 11 and 12

Claims 9, 11 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Baker in view of Berger.

In claim 9, the step of converting a corpus of sentences comprises converting a corpus of sentences from at least two different languages.

In the Office Action, it was asserted that it would be obvious to replace the speech signal of Baker with a corpus having sentences in two different languages as found in Berger. As noted above, this is not at all obvious. Neither reference suggests this combination and replacing the input speech signal of Baker with a corpus destroys the functionality of Baker. As such, those skilled in the art would never make such a substitution.

In addition, there is no teaching in either reference for how a corpus having sentences in two different languages could be placed in Baker to form a functioning system that reads on claim 9. For example, if a corpus having sentences in two different languages is added to Baker, where would it be added such that it is converted into a meaning set as required by claim 9?

Since there is no suggestion in either reference for combining Baker with Berger and since it is not clear how the references could be combined to form a functioning system that reads on claim 9, claim 9 is not obvious from the combination of Baker and Berger.

Claims 11 and 12

Dependent claims 11 and 12 depend indirectly from claim 8. As noted above, Baker does not show or suggest the invention of claim 8. The combination of Berger with Baker also does not show or suggest the invention of claim 8.

In particular, the combination of these two references does not result in a system that is able to convert a corpus of sentences into at least two meaning sets and then is able to evaluate the performance of one or more of two natural language units by comparing the meaning sets. The only portion of either of these references that can remotely be called a comparison step is the step in Baker in which the candidate words produced by one speech recognizer are compared to the candidate words produced by another speech recognizer to determine if both speech recognizers have produced the same words. However, if the input speech signal of Baker was replaced with the corpora of Berger, the speech recognizers of Baker would not produce a candidate list because the speech recognizers require a speech input. Without the candidate lists, no comparison would be performed in Baker as required by claim 8.

Since the combination of Baker and Berger would not produce a comparison of meaning sets as required by claim 8, claims 11 and 12, which depend indirectly from claim 8, are patentable over the combination of Baker and Berger.

Claims 13 and 14

Claims 13 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Baker in view of Berger and further in view of Lou et al. (U.S. Publication 2002/0111793, hereinafter Lou). Claims 13 and 14 depend indirectly from claim 8 and include further steps of changing a syntactic parser in a natural language unit and changing a semantic interpreter in a natural language unit, respectively.

The combination of Baker, Berger and Lou does not render claims 13 and 14 obvious because it does not render claim 8 obvious. As noted above, Baker uses a speech signal input and replacing this input with a corpus of sentences such as in Berger would change Baker so dramatically that it would no longer be able to produce meaning sets or compare meaning sets as required by claim 8. The addition of Lou does not overcome this problem.

In addition, in claims 13 and 14, the syntactic parser and the semantic identifier that are changed form part of a natural language unit that was evaluated by comparing at least two meaning sets. Although Lou shows changing a parser, it does not show changing a parser that has had its performance evaluated by comparing two meaning sets. Instead, it changes the parser to maximize a score for a single set of parsed data. It never compares two meaning sets to evaluate the performance of a natural language unit. As such, none of the cited references show or suggest changing a syntactic parser or semantic identifier that form part of a natural language unit that was evaluated by comparing at least two meaning sets.

Since the proposed combination would destroy the functionality of Baker and since none of the references show changing a syntactic parser or semantic identifier that were evaluated by comparing two meaning sets, claims 13 and 14 are patentable over the combination of Baker, Berger and Lou.

Claim 16

Claim 16 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Baker. In the Office Action, it was asserted that although Baker does not teach generating action sets from corpora, it would be obvious to modify the system of Baker to generate action sets from text instead of speech signals because text requires less space. However, as noted above, replacing the

speech signals in Baker with text would completely destroy the purpose of Baker, which is to recognize speech not text.

In addition, in claim 16, a first action set is generated from a first corpus and a second action set is generated from a second corpus. However, in Baker, only a single speech signal is provided. There is no first speech signal and second speech signal.

Since replacing the speech signal of Baker with corpora would destroy the functionality of Baker, it would not be obvious to use corpora instead of speech signals in Baker. As such, the invention of claim 16 is not obvious from Baker.

Claim 17

Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Baker in view of Berger.

Claim 17 depends from claim 16 and includes a further limitation where the first corpus is a corpus written in a first language and the second corpus is the corpus written in a second language.

As noted above, it would not be obvious to those skilled in the art to replace the speech signal of Baker with a text written in two different languages. Although Berger shows two corpora written in two different languages, those skilled in the art would never replace the speech signal in Baker with such corpora. Not only would this destroy the functionality of Baker because it would remove the speech recognition step which is fundamental to Baker, there is no discussion in Baker as to how such a corpus written in two different languages could be integrated into Baker to form a functional apparatus.

Since the suggested combination would destroy the functionality of Baker and since neither Baker nor Berger suggest making this combination, the invention of claim 17 is not obvious from the combination of Baker and Berger.

Conclusion

In light of the above remarks, claims 1-17 are patentable over the cited art. Reconsideration and allowance of the claims is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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